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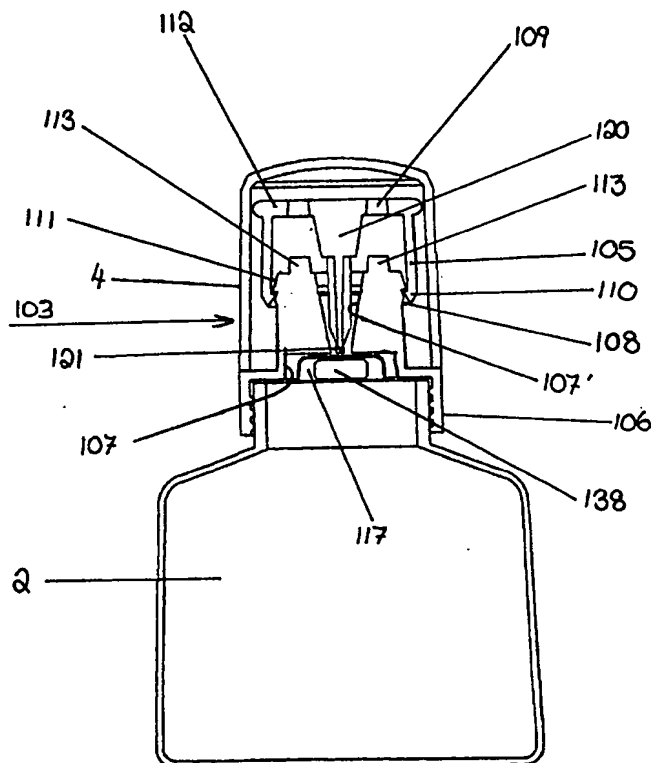
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(54) Title: DISCHARGE CAP WITH RELEASABLE TABLET BASKET**(57) Abstract**

A cap (3, 103) for a container (2) where a drink, made of two components, can be stored or carried with the components stored separately. The components are mixed prior to the consumption of the drink. The cap (3, 103) includes a collar (6, 106) secured to the container (2) and a top (5, 105) which is in two parts. The top (5, 105) is moveable between an open and a closed position. When the top (5, 105) is initially in the open position, a basket (17, 37, 117) between the top (5, 105) and the liquid initially holds the material (38), which can be a powder or tablet. The top (5, 105) is initially closed to release the seal between the liquid and the material, the drink is shaken, and the top (5, 105) reopened for a passageway from the liquid to the exterior of the cap (3, 103). A cover (4) is releasably secured over the cap (3, 103).



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DISCHARGE CAP WITH RELEASABLE TABLET BASKET

Technical Field

5 The present invention relates to a cap for a container, in which the cap includes means for releasing material contained within the cap into the container.

Background Art

10 Different styles of caps or lids for containers (for liquids) are prolific. They are known in a variety of forms, which can include, for example: a tamper-evident ring; the ability to be resealable; a screw-thread; or a combination of these. Such caps also include those that can be drunk through and resealed ("sipper tops"), either with or without a screw thread, so that the container is re-usable.

15 Drinks and drink containers where two components making the drink are best mixed immediately before drinking are available separately. However for some types of drink, where the concentrate is in tablet or powder form, the availability of drinks with all elements for the drink in the one container are rare and hard to find commercially.

20 An object of the present invention is the provision of a cap which, when combined with an appropriate container, permits two elements of a drink to be separately contained within the one container and mixed immediately before the user desires the drink. A further object of the invention is the provision of such a cap and container so as to offer an economic alternative to presently available containers.

25 For the purposes of this specification, the term "cap" is used to describe any lid or cap or closure for a container or bottle with a top opening. Also, the term "container" is used to cover any vessel with a top opening which is capable of carrying or retaining a liquid, regardless of the material of which it is made.

Summary of the Invention

The present invention provides a cap for a container with a top opening and capable of containing a liquid, said cap including:

30 a collar with means for securing the cap to the container about the top opening, said collar being formed with a cylindrical passage therethrough;

a neck portion including a top portion, a bottom portion, and a seal-breaking means, wherein the neck portion has a passage therethrough, and said top portion is moveable relative to the bottom portion which is secured to the collar, said top portion

being moveable between an open position and a closed position, in which closed position said bottom portion provides a seal for retaining liquid within the container; and a basket capable of containing therein a solid which is capable of dissolution in the liquid in the container;

5 releasable means for maintaining the top portion in the open position; and a cover which is releasably securable to the collar about the cap; wherein when initially said top portion is in said open position the liquid is sealed within said container by the basket, and

10 when said top portion is initially moved to the closed position said seal is broken by the interaction of said seal-breaking means and the basket; and wherein thereafter, when the top portion is moved to the open position, a passage for fluid from the container is provided.

15 Preferably said cap is capable of reuse with a new basket, so that the cap and container can be used for more than one drink in which the liquid and the powder are kept separate until required as a finished drink.

 In one option said basket is cylindrical with a flat base wherein the external diameter of the sides of the basket are substantially the same as the exterior diameter of the bottom portion.

20 Preferably, the top portion of the neck includes a section that narrows to a narrow opening with a diameter less than the diameter of the top of the container. Preferably the sealing means includes two flat surfaces, one of the top of the collar and one on the underside of a flange on the neck portion and wherein the fit between the neck portion and the collar is a push fit. Preferably also the opening in the top portion of the neck is covered by a removable seal.

25 Preferably the basket is open at the top. Preferably the internal diameter of the basket is of a size sufficient that a tablet of concentrate or other material can be inserted therein prior to the assembly of the cap and container.

30 Alternatively, in a second option, the neck portion includes a seal-breaking means that is in the form of a prong or pointed end, which is integrally formed with the top portion. In this option the top portion forms part of a sipper top (being re-usable, re-sealable) of known type, and the basket is formed from a piece of foil. Said foil includes a foil wrapped tablet. The seal-breaking means pierces the foil, thus releasing the tablet for dissolution within the liquid in the container.

 In both options, the cover and the collar have therebetween a tamper-evident

ring or other known means of determining evidence of tampering. The cover is either an interference fit with the collar or is screw-threaded onto the collar, to permit the cover to be repeatedly put on and taken off the cap.

5 **Brief Description of the Drawings**

By way of example only, preferred embodiments of the present invention are described in detail with reference to the accompanying drawings, in which:-

Fig. 1 is a side section view of a container with a first preferred embodiment of the present invention in an initial open position;

10 Fig. 2 is a perspective section view of the cap and container of Fig. 1;

Fig. 3 is a side section view of the container of Fig. 1 in a closed position;

Fig. 4 is a perspective section view of a container of Fig. 1 with the cap in the closed position;

15 Fig. 5 is a side section view of a second preferred embodiment of the cap and container, with the cap in the initial position, in accordance with the present invention;

Fig. 6 is a perspective section view of the embodiment as shown in Fig. 5;

Fig. 7 is a side section view of the cap and container of the second preferred embodiment between the initial open position and a closed position; and

20 Fig. 8 is a second side section view of the second preferred embodiment between the initial open position and the closed position.

Best Mode for Carrying Out the Invention

A first preferred embodiment of the invention is shown in Figs. 1 to 4. A container 2 with a cap 3 is shown. The cap 3 includes a screw-thread that is
25 compatible with the screw-thread on the outside of the top of the container 2. Alternatively, the cap 3 may be a snap fit to the top of the container 2, in known manner. The fit can be either a releasable snap fit or not, as is desired.

30 The cap 3 includes a cover 4, a neck portion 5 and a collar 6. The collar 6 may extend to include the screw-thread or snap fit as described above. The collar 6 may be formed integrally therewith, if so desired. The collar 6 includes a cylindrical hollow passage therethrough with sides 7. At the top of the collar 6 is a flange 8 formed integrally with the collar 6.

The neck 5 is open at each end so that liquid may pass through the neck 5. In Fig. 1 a passage 9 is represented as tubular. However, if so desired, the passage

9 may follow the profile of the exterior of the neck portion 5.

5 A neck flange 10 is formed between a top portion 11 and a bottom portion 12 of the neck 5. The top portion 11 is tapered inwards towards the outlet 13, for ease of pouring and/or drinking from, as is desired. The outlet 13 is initially sealed with a use-once tab 14. The exterior of the bottom portion 12 is cylindrical, with walls 16 and a flat end 15. The dimensions of the walls 16 (of the bottom portion 12 and of the walls 7 of the collar 6) are such that there is a tight, but movable fit between the two elements.

10 A basket 17 has a bottom 18 and cylindrical sides 19. The diameter of the sides 19 is the same as that of the sides 16 of the bottom portion 12. Thus the basket 17 is a push fit into the lower part of the inside of the collar 6. The bottom 18 has a diameter greater than that of the sides 19 of the basket 17, so that when the basket 17 is in position in the lower part of the cap 3 (inside the collar 6), there is a liquid seal formed between the bottom 18 and the collar 6.

15 Referring to Fig. 3 an alternative embodiment of the basket 37 is thereshown. The basket 37 includes slots 20 from the open top of the basket 37. The slots 20 are evenly spaced about the circumference of the basket 37. A tablet of material 38 is contained within the basket 37 when the basket 37 is in the initial position of Fig. 1.

20 Referring to Figs. 1 and 2, a cover 4 is shaped to fit over the collar 6 and neck portion 5. The shape of the collar flange 8 is such that the cover 4 is a push fit onto the end of the flange 8. Thus the cover 4 can be resealed onto the cap 3. If so desired, a tamper-evident ring, or overt tamper-evident seal (not shown) may be added between or about the cap 3 and cover 4, and be formed integrally with either part, depending on the type of tamper evident device used.

25 The above described cap 3 works as follows: the tablet 38 (or material to be kept separate until mixed to form the desired drink) is inserted into the basket (17, 37). This is push fitted into the lower part of the collar 6. By this action the neck 5 is pushed to an open position (Fig. 1). The cap 3 is then fitted to the container 2. The container 2, prior to this, is filled with liquid. This can be any liquid, but most commonly will be purified water.

30 If the container 2 is to be sold commercially in this form, any tamper evident devices (etc) and the use-once tab 14 are optionally fitted. As an alternative to the use-once tab 14, the cover 4 may include an inset portion (not shown) which fits against the top of the neck portion to seal the opening 13 when the container 3 is not in use (a sipper top).

When the drink is to be mixed, any tamper evident ring is removed. The cover 4 is taken off and the neck portion 5 pushed down towards the container 2 (arrow A, Fig. 2). The flat end 15 of the neck portion 5 pushes down the basket (17, 37) (arrow B, Fig. 2) which falls into the container 3. The cap 3 is now in the closed position (Fig. 3).

The length of the walls 16 of the lower portion 12 are such that when the cap 3 is in the closed position the flat end 15 is adjacent the bottom of the walls 8 of the collar 6. Also, when the cap 3 is in the closed position, the neck flange 10 rests against the flange 8, forming a liquid seal therebetween.

The basket (17, 37) falls to the bottom of the container 3. As the tablet of material 38 is now exposed to the liquid in the container 2, the tablet 38 starts to dissolve. Alternatively, the tablet 38 can be shaken through the liquid to form a uniform solution or suspension. The cover 4 can be put back over the cap 3 before any shaking or other mixing is effected, to retain the solution within the container 2. In the alternative embodiment of the basket 37, the slots 20 assist in speeding up the rate of dissolution by allowing greater access of the liquid to the tablet 20.

The above cap 3 and container 2 have been described with reference to a cap 3 that may be re-used. However it will be appreciated that the container 2 and cap 3 can be manufactured and sold in a ready to use format, permitting a once-only use for one drink. Also, the cap 3 and container 2 have been described with reference to the use of a snap fit on the cap 3. If so desired, the cap 3 and container 2 may be screw-threaded, so that both may be recycled. Also, if so desired, the neck 5, collar 6 and basket (17, 27) may be screw-threaded, with an inter-engagement means operable between the basket and the neck 5. Thus if the neck 5 is screwed to the closed position, the basket (17, 37) is rotated also, dropping into the container 2.

The cap 3 may be made in four parts - the cover 4, neck 5, collar 6 and basket (17, 37). However it will be appreciated that more, or less parts may be formed. For example, if so desired, the basket (17, 37) may be formed with the lower portion 12 of the neck 5, with many slots or gaps between the two parts. Pushing the neck 5 down would push the basket (17, 37) into the container 2. Thus the tablet 38 could be mixed into the liquid by shaking the container 2 to bring the liquid and the tablet 38 into contact. However, the basket (17, 27) would remain attached to the neck 5. This would also necessitate forming the neck 5 and basket (17, 37) around the tablet 37.

The basket (17,37) may also include an open weave webbing across the top,

added after the tablet or material 38. This may be especially suitable where the tablet 38 is replaced with a very friable material. As can be seen, the material to be added to the drink need not be in tablet form, but may be a powder either loose or slightly compressed. Also, the resultant drink may be one that is a suspension, not a solution, as is desired. The tablet may include an effervescing agent, as is desired.

The above described container 2 and cap 3 have been described with reference to a collar 6, neck 5 (etc) that are all circular in cross-section. However it will be appreciated that the invention need not be limited to such a cross-sectional shape, and that the two cross-sections need not be the same, without departing from the scope of the invention.

The cap 3 with cover 4 can be formed of any plastics material. The component parts may be machined and milled, cast, or injection moulded, as is desired.

A second preferred embodiment of the invention is shown in Figs. 5 to 8. Like parts from the first preferred embodiment are numbered in the same manner as the first embodiment. In this embodiment the cap 103 can be fitted onto a container 2 with either a screw thread or a snap fit and be can re-usable, or not, as is desired.

The cap 103 includes a cover 4, a neck portion 105 and a collar 106. The collar 106 may extend to include the screw-thread or snap fit as described above and may also be formed integrally therewith, if so desired. The neck portion 105 includes a lower, circular-shaped edge 110 which is slidably engaged with the periphery of the upper portion of the collar 106

At the top end of the collar 106 is formed an arcuate projection 108. The projection 108 is peripheral to the collar 106. The projection 108 aids in keeping the neck portion 105 in the open position by retaining the lower shaped edge 110 thereabove, until external force in the direction of arrow C (Fig. 7) forces the neck portion 105 past the projection 108. Immediately above the projection 108 is a hook 111 formed integrally with the collar 106, which is peripheral to the top of the collar 106. The hook 111 interacts with the shaped edge 110 to prevent the top coming off the collar unintentionally when the neck portion 105 is being moved between the open and the closed positions (described below).

The neck portion 105 includes a top 112 with at least one hole 109 therethrough. The number of holes 109 may be increased up to four, as is desired. A downwardly facing prong 120 is secured to the underside of the top 112, or formed integrally therewith, as is desired. The prong 120 has a shaped tip 121 which may be

sharpened for piercing foil, if so desired. As shown in Fig. 6 the prong 120 may have a cross-section in the shape of a cross. Alternatively, if so desired, the prong 120 may have another cross-section, for example circular.

5 The internal sides 107 of the collar 106 may be circular in cross-section, as in the first preferred embodiment. Alternatively, if so desired, the shape may include complementary internal sides 107' to the configuration of the prong 120 to assist in retaining the prong 120 in the one central position relative to the sides of the cap 103. The sides (107 or 107') and the prong 120 form a shaped passage through the collar 106.

10 The top of the collar 106 includes at least one shaped projection 113. The projections 113 are of a number and shaped in a manner complementary to the holes 109 in the neck portion 105. Thus when the neck portion 105 is in the closed position the projections 113 enter the holes 109 and form a liquid seal between the exterior of the container 2 and the exterior of the container 2.

15 An liquid seal between the interior of the container 2 and the cap 103 is formed by a basket 117. The basket 117 comprises a patch of foil which has a diameter such that the foil extends between the top of the container 2 and the collar 106, forming a seal therebetween. The basket 117 encases the tablet 138 between two layers of foil, which is sealed into the foil casing by known means.

20 When the neck portion 105 is in the initial open position, the lowest part of the tip 121 is positioned above the top of the basket 117 (Fig. 5).

The above described embodiment works as follows: the cover 4 is removed and the neck portion 105 pushed downward (arrow C, Fig. 7). This forces the tip 121 against the foil of the basket 117. The lower portion of this foil basket 117' (Figs. 7 and 8) gives way, allowing the tablet 138 to fall into the container 2. At the same time, this downward movement forces the shaped edge 110 over the projection 108. The motion of the neck portion 105 is stopped when the projections 113 sit in the holes 109, forming a liquid seal between the interior and the exterior of the cap 103. The container 2 can be shaken or agitated so that the solid in the tablet 138 dissolves in the liquid in the container 2.

30 When the drink is to be drunk, the neck portion 105 is lifted upward (to the position shown in Fig. 6). With the basket 117 seal broken there is a liquid passage from the container 2, through the basket 117, the collar 106 and the neck portion 105 to the exterior. If the container 2 is to be resealed, the neck portion 105 is pushed

downward again, so that the projections 113 sit in the holes 109, forming the liquid seal again. Thus the container 2 can be safely carried after partial consumption of the liquid within the container 2.

5 The container 2 and cap 103 can be re-used, if so desired. The cap 103 can be removed from the container 2 and a fresh basket 117 with tablet 138 passed on the top of the container 2. The cap 103 can be replaced on the container 2 and the cover 4 replaced over the cap 103. Thus the container 2 and cap 103 can be carried and reused, if so desired.

10 The formation of the parts of the cap 103 and container 2 (and their manufacture) and the various styles of and manners of use of the second preferred embodiment are the same as those described above for the first preferred embodiment.

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Claims:-

1. A cap for a container with a top opening and capable of containing a liquid, said cap including:

5 a collar with means for securing the cap to the container about the top opening, said collar being formed with a cylindrical passage therethrough;

a neck portion including a top portion, a bottom portion, and a seal-breaking means, wherein the neck portion has a passage therethrough, and said top portion is moveable relative to the bottom portion which is secured to the collar, said top portion
10 being moveable between an open position and a closed position, in which closed position said bottom portion provides a seal for retaining liquid within the container; and

a basket capable of containing therein a material which is capable of dissolution in the liquid in the container;

releasable means for maintaining the top portion in the open position; and

15 a cover which is releasably securable to the collar about the cap; wherein

when initially said top portion is in said open position the liquid is sealed within said container by the basket, and

when said top portion is initially moved to the closed position said seal is broken by the interaction of said seal-breaking means and the basket; and wherein
20

thereafter, when the top portion is moved to the open position, a passage for fluid from the container is provided.

2. A cap for a container as claimed in claim 1 wherein said cap is capable of re-
25 use, the collar having releasably securable means for securing the cap to the container.

3. A cap for a container as claimed in claim 2 wherein the basket is capable of re-use with fresh material.

4. A cap for a container as claimed in any one of the preceding claims wherein said basket is cylindrical with a flat base wherein the external diameter of the sides of the basket are substantially the same as the exterior diameter of the bottom portion.

5. A cap for a container as claimed in any one of the preceding claims wherein the top portion of the neck includes a section that narrows to a narrow opening with a diameter less than the diameter of the top of the container. Preferably the sealing means includes two flat surfaces, one of the top of the collar and one on the underside of a flange on the neck portion and wherein the fit between the neck portion and the collar is a push fit.

6. A cap for a container as claimed in any one of the preceding claims wherein the opening in the top portion of the neck is covered by a removable liquid seal.

7. A cap for a container as claimed in any one of claims 1 to 3 wherein the neck portion includes a seal-breaking means that is in the form of a prong or pointed end, which is integrally formed with the top portion.

8. A cap for a container as claimed in any one of claims 1 to 3 and 7 wherein the cap is capable of re-use with a new basket.

9. A cap for a container as claimed in any one of claims 1 to 3 and 7 wherein the basket is formed from a piece of foil and the material is in tablet form encased within the foil.

10. A container with a cap, to contain a drink which is mixed in the container prior to consumption, the ingredients being a liquid and a material which are stored separately within the container, said cap being as claimed in any one of the preceding claims.

11. A cap for a container substantially as hereinbefore described and with reference to any one of Figs. 1 to 4 or Figs. 5 to 8 of the accompanying drawings.

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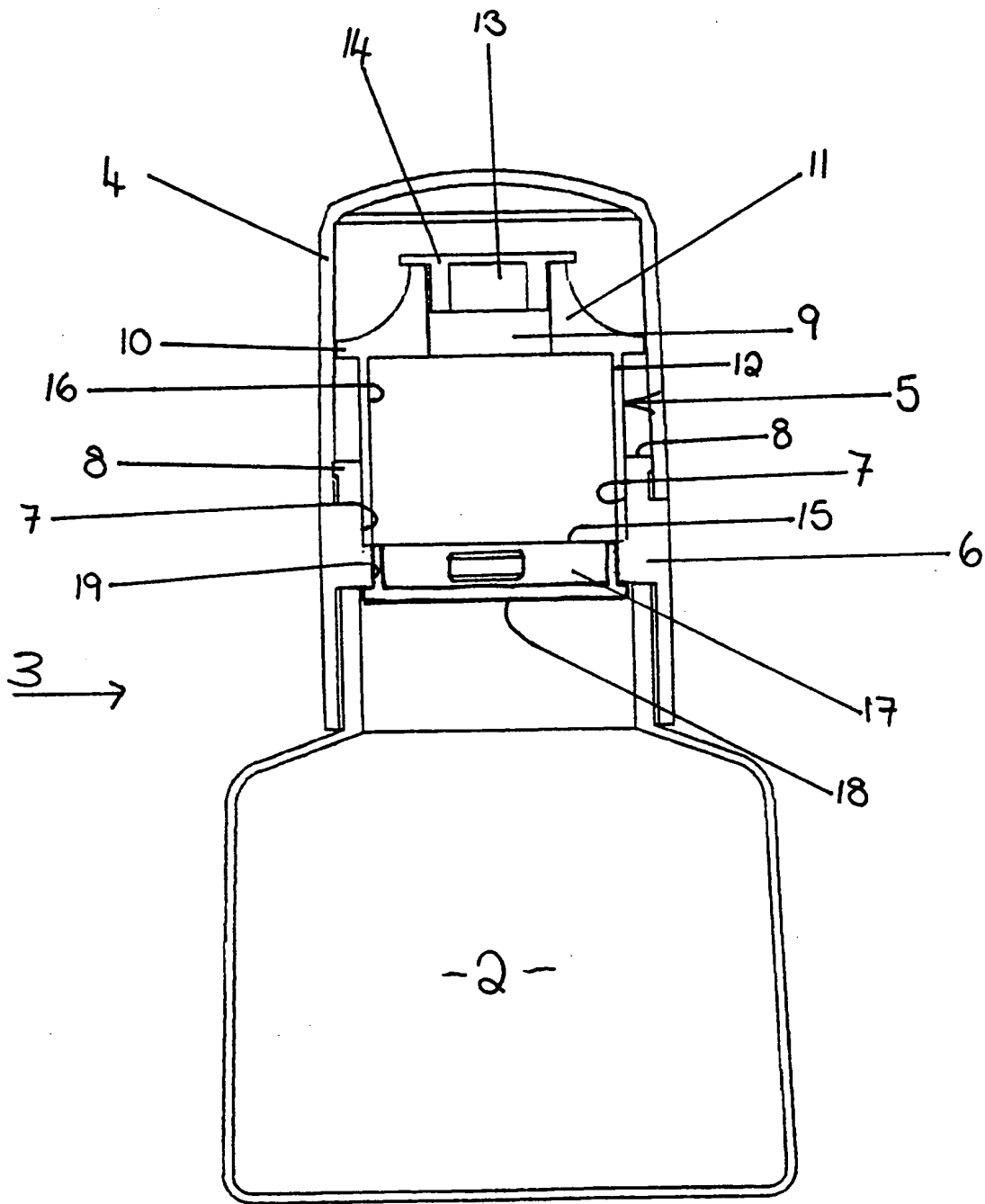


FIG. 1

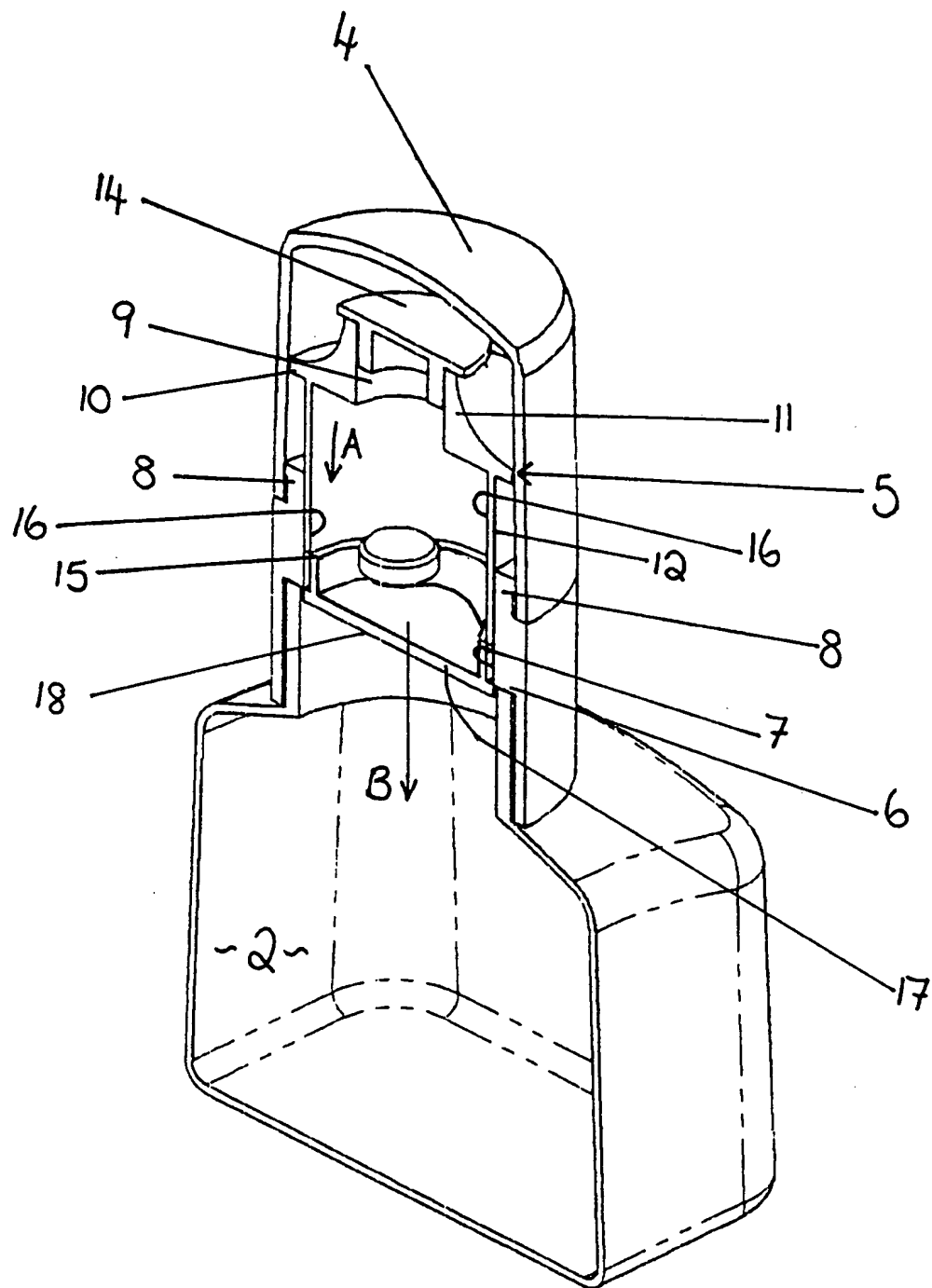


FIG. 2

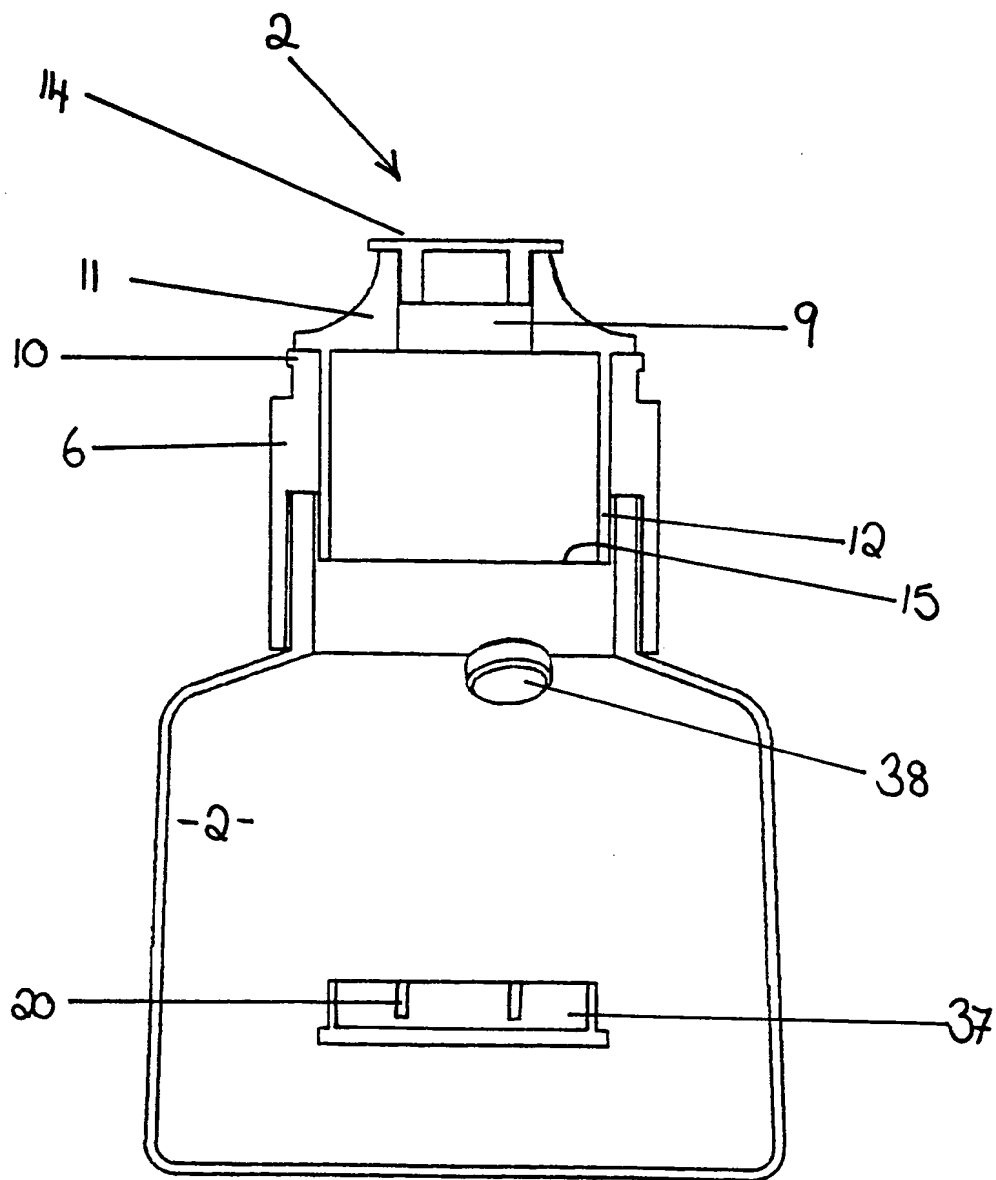


FIG. 3

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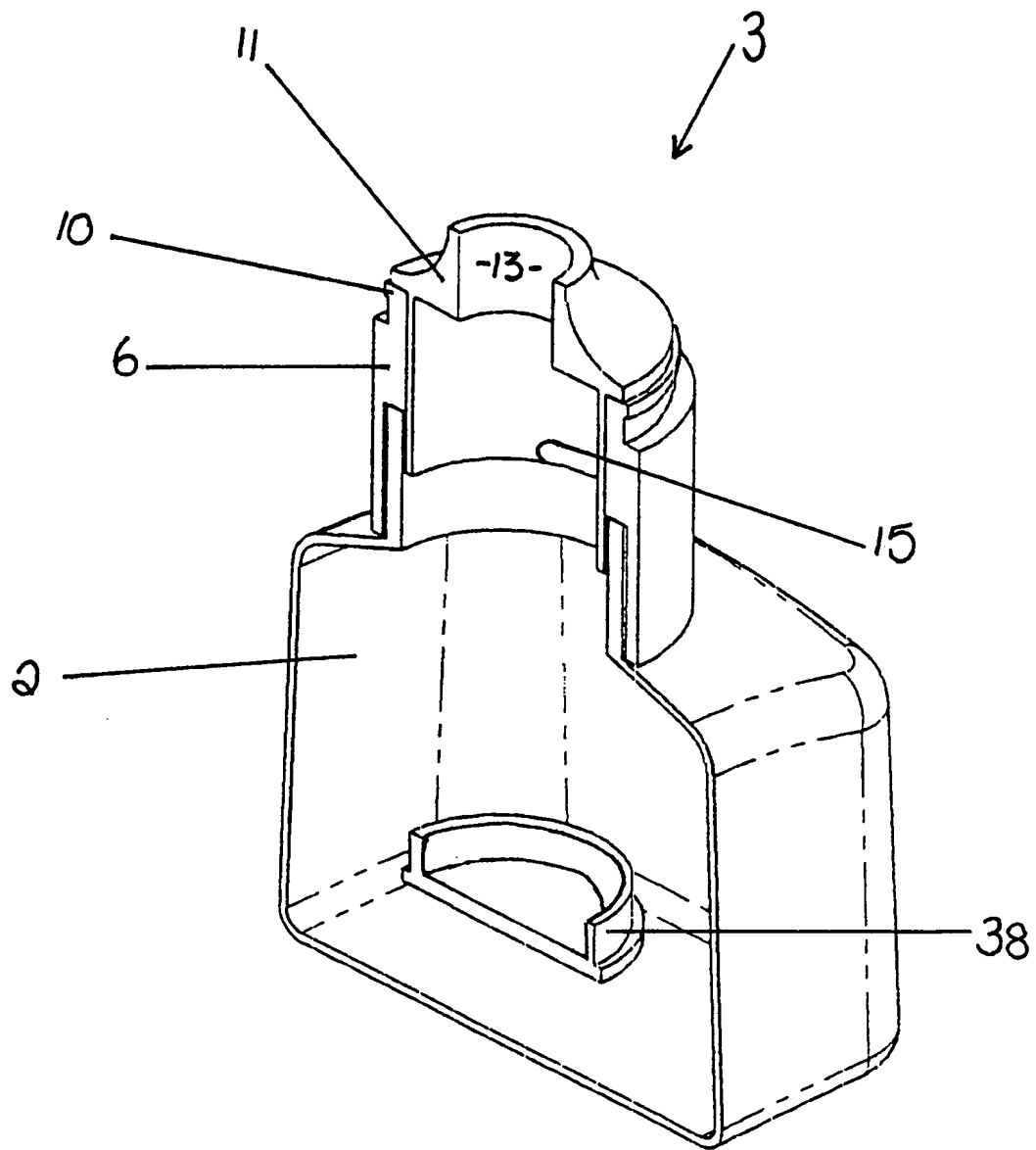


FIG. 4

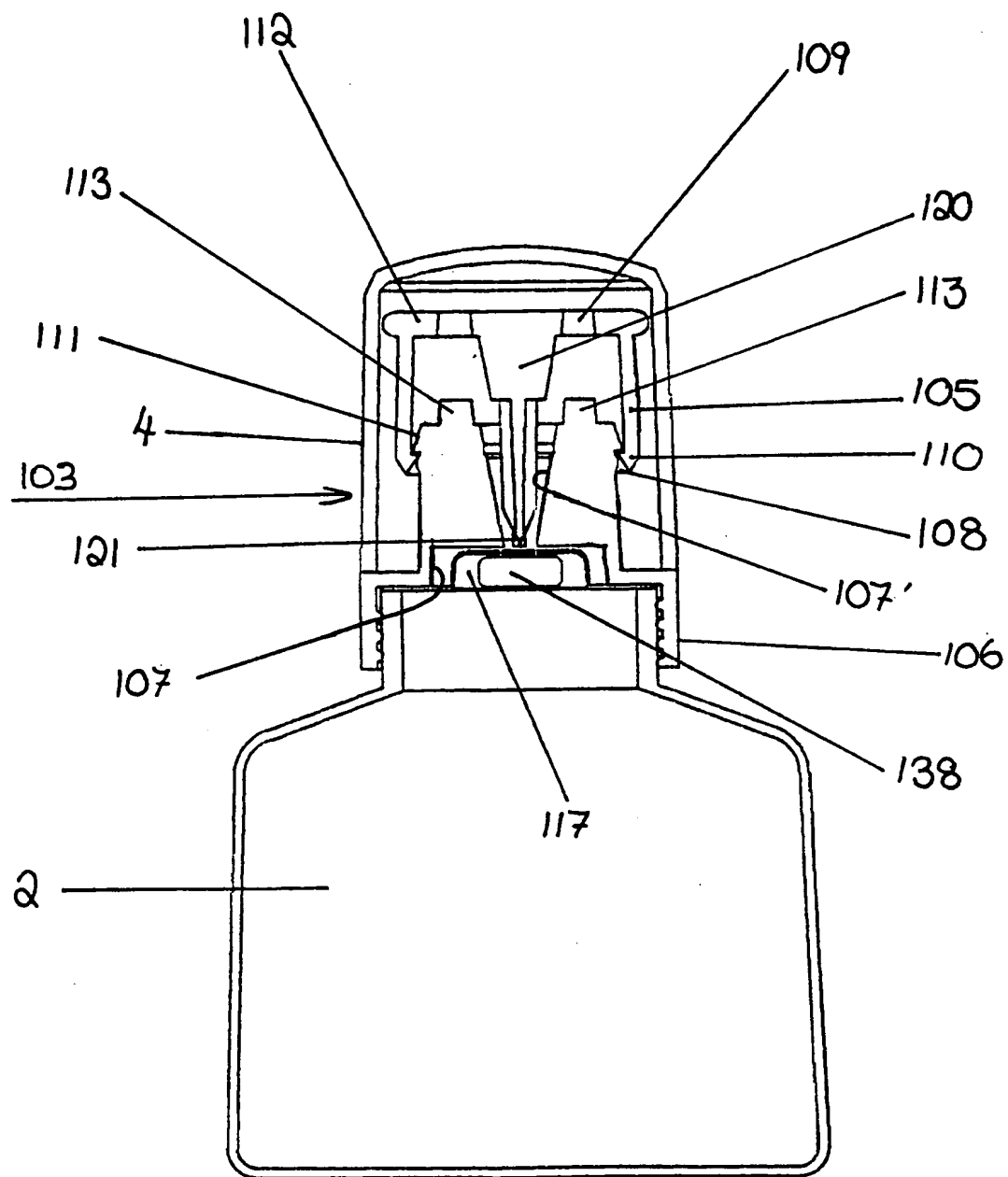


FIG. 5

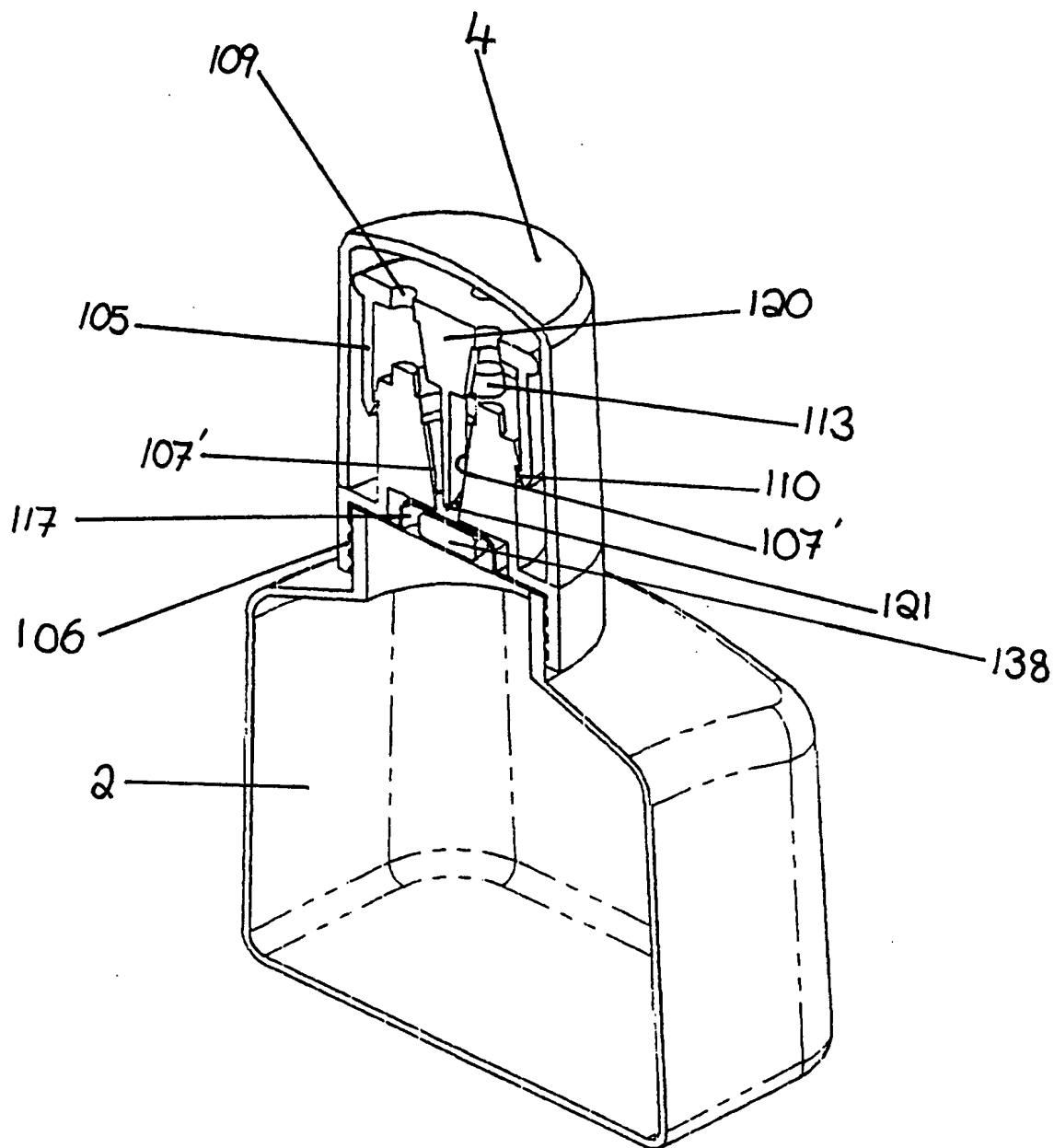


FIG. 6

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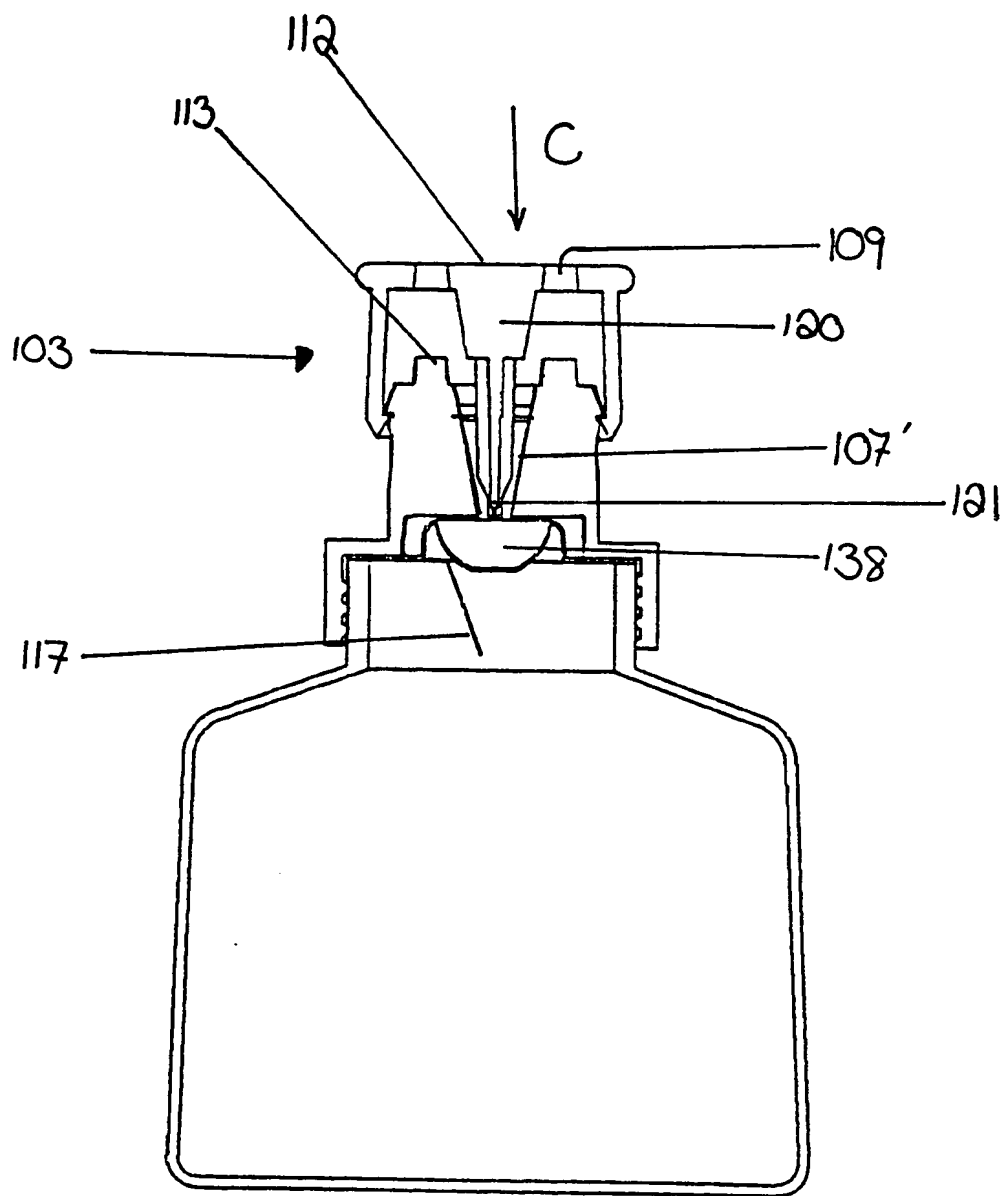


FIG. 7

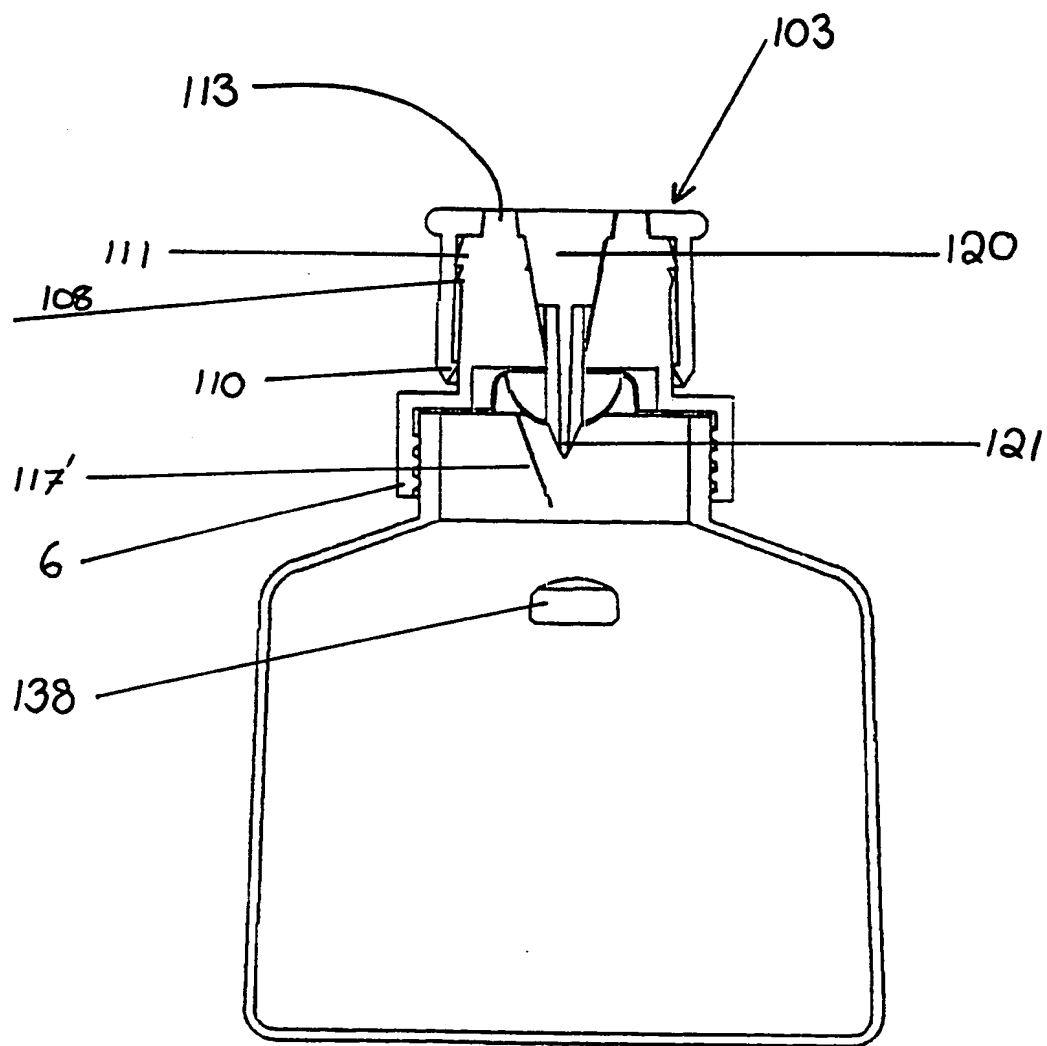


FIG 8